	Application No.	Applicant(s)
	10/669,680	WEHRENS ET AL.
Notice of Allowability	Examiner	Art Unit
	Gordon J Stock	2877
The MAILING DATE of this communication appeal All claims being allowable, PROSECUTION ON THE MERITS IS herewith (or previously mailed), a Notice of Allowance (PTOL-85) NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RI	(OR REMAINS) CLOSED in or other appropriate comm GHTS. This application is	n this application. If not included unication will be mailed in due course. <b>THIS</b>
1. X This communication is responsive to <u>amendment of 8/11/0</u>	<u>4</u> .	
2. ⊠ The allowed claim(s) is/are <u>1-19</u> .		
3. $igotimes$ The drawings filed on <u>11 August 2004</u> are accepted by the	Examiner.	
<ul> <li>4. Acknowledgment is made of a claim for foreign priority ur</li> <li>a) All b) Some* c) None of the:</li> <li>1. Certified copies of the priority documents have</li> <li>2. Certified copies of the priority documents have</li> <li>3. Copies of the certified copies of the priority do</li> <li>International Bureau (PCT Rule 17.2(a)).</li> <li>* Certified copies not received:</li> </ul>	been received. been received in Application	on No
Applicant has THREE MONTHS FROM THE "MAILING DATE" noted below. Failure to timely comply will result in ABANDONM THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.		a reply complying with the requirements
5. A SUBSTITUTE OATH OR DECLARATION must be subm INFORMAL PATENT APPLICATION (PTO-152) which give		
6. CORRECTED DRAWINGS ( as "replacement sheets") mus	st be submitted.	
(a) ☐ including changes required by the Notice of Draftspers		v ( PTO-948) attached
1)  hereto or 2)  to Paper No./Mail Date		
(b) including changes required by the attached Examiner's Paper No./Mail Date	s Amendment / Comment o	r in the Office action of
Identifying indicia such as the application number (see 37 CFR 1 each sheet. Replacement sheet(s) should be labeled as such in t		
7.   DEPOSIT OF and/or INFORMATION about the depo attached Examiner's comment regarding REQUIREMENT		
Attachment(s) 1. ⊠ Notice of References Cited (PTO-892)	5. ☐ Notice of In	formal Patent Application (PTO-152)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)		ummary (PTO-413),
Information Disclosure Statements (PTO-1449 or PTO/SB/C Paper No./Mail Date		/Mail Date Amendment/Comment
4. Examiner's Comment Regarding Requirement for Deposit	8. 🛛 Examiner's	Statement of Reasons for Allowance
of Biological Material	9. ⊠ Other <u><i>PTO</i></u>	<u>L-413B</u> .

### **EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. E. Rico Hernandez on September 2, 2004.

An amendment to the specification follows to overcome objections to the specification/drawings in action of June 29, 2004 (specifically, page 3 paragraph 2: part 5).

Please replace paragraph [0036] on page 10 with the following:

[0036] To determine the position of the focal plane, projection lens PL projects into space an image of a TIS pattern provided on the reticle RE, having contrasting light and dark regions, as depicted in FIG. 2B. As shown in FIG. 2B, the TIS pattern may be provided along rows (j+1) to (-j-1) of the reticle RE, having constituent marks Txh, Tyh. The layout of the TIS patterns may be characterized by the periodicity of the marks, which corresponds to the distance of the marks along the x-direction as r mm and along the y-direction s mm. The wafer stage WS is then scanned horizontally and vertically so that the aperture TIS passes through the space where the aerial image is expected to be. As the TIS aperture passes through the light and dark portions of the image of the TIS pattern, the output of the photo-sensitive detectors will fluctuate. The vertical level at which the rate of change of amplitude of the photodetector output is highest indicates the level at which the image of TIS pattern has the greatest contrast and hence indicates

Art Unit: 2877

the plane of optimum focus. An example of a TIS of this type is described in greater detail in US 4,540,277. Instead of the TIS, a Reflection Image Sensor (RIS) such as that described in US 5,144,363 may also be used.

Please replace paragraph [00129] on page 20 with the following:

[00129] In one embodiment, the linear and corkscrew reticle RE and reticle stage RS distortions W<sub>r</sub>, W<sub>rs</sub>, C<sub>r</sub>, C<sub>rs</sub> may be resolved by exposing a reticle RE having a specific TIS pattern that enables the reticle RE to be loaded in two distinct orientations (e.g., 0° and 180°) during exposure. As illustrated in FIG. 4, the patterns are configured as sets of marks that are mirror images of each other. As noted above, regarding FIG. 2B, the layout of the patterns may be provided along rows (j+1) to (-j-1) and the distance related to the periodicity of the constituent marks of the patterns are designated as r mm along the x-direction and s mm along the ydirection. With such a pattern, the reticle RE is loaded and exposed with one orientation and then the wafer substrate W is measured. The same reticle RE is subsequently rotated and exposed with a second orientation and then the wafer substrate W is measured again. By so doing, the measurements between the two orientations provide conjugate sets of height offsets that can be applied to equation (10) to resolve the reticle RE linear wedge and corkscrew distortions Wr. Cr.

Application/Control Number: 10/669,680 Page 4

Art Unit: 2877

### Allowable Subject Matter

2. Claims 1-19 are allowed.

3. The following is an examiner's statement of reasons for allowance:

As to claim 1, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a method of calibrating a reticle stage of a lithographic system decomposing a set of measured height offsets into a plurality of distortional factors, in combination with the rest of the limitations of claims 1-9 and 18.

As to claim 11, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a system for calibrating a reticle stage of a lithographic system the particular processing mechanism and reticle stage actuation mechanism, in combination with the rest of the limitations of claims 11-17 and 19.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

## Response to Arguments

4. Applicant's arguments, see Remarks, filed August 11, 2004, with respect to rejections under 35 U.S.C. 103(a) in action of June 29, 2004 have been fully considered and are persuasive. In view of the persuasive arguments and the amendment to the claims the rejection under 35 U.S.C. 103(a) of claims 1-4, 6-13, and 15-17 has been withdrawn.

Art Unit: 2877

### Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US 2004/0130689 A1 to Starikov et al.

# Fax/Telephone Numbers

If the applicant wishes to send a fax dealing with either a proposed amendment or a discussion with a phone interview, then the fax should:

- 1) Contain either a statement "DRAFT" or "PROPOSED AMENDMENT" on the fax cover sheet; and
  - 2) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Papers related to the application may be submitted to Group 2800 by Fax transmission. Papers should be faxed to Group 2800 via the PTO Fax machine located in Crystal Plaza 4. The form of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Machine number is: (703) 872-9306

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gordon J. Stock whose telephone number is (571) 272-2431.

The examiner can normally be reached on Monday-Friday, 10:00 a.m. - 6:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached at 571-272-2800 ext 77.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

Application/Control Number: 10/669,680

Art Unit: 2877

Page 6

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private Pair system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gs gs

September 2, 2004

Zandra V. Smith Primary Examiner Art Unit 2877